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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/903,059	07/10/2001	Constantin Bulucea	NS-4971US	9375

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EXAMINER	
FARAHANI, DANA	

ART UNIT	PAPER NUMBER
2814	

DATE MAILED: 10/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/903,059	BULUCEA, CONSTANTIN	
	Examiner	Art Unit	
	Dana Farahani	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *17-122* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *17-122* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 17-31, 38-67; 69 and 71-98, 100-113, and 115-122 are rejected under 35 U.S.C. 102(e) as being anticipated by Litwin et al., hereinafter Litwin (U.S. 6,100,770).

Regarding claims 17-19, 21, 23-28, 38, 41, 43-46, 53, 61, 67, 69, 70-72, and 79-83, Litwin discloses in figure 4 a structure comprising a varactor which comprises a plate region 13 and a body region 12 with plate electrode 17 and a body electrode 19; a dielectric 15 of figure 1 is over the body region, the gate voltage being held constant while the body voltage is varied, and a gate electrode 16 of figure 4 (see column 5, lines 58-67). Note that applying, and varying a voltage, which results in creation of an inversion layer, adds no structural limitations to the device. Nevertheless, Litwin discloses at column 5, lines 58-67, that CA and CB are fixed potentials, and a suitable voltage applied to well 12 to control the capacitance. Also, it is

mentioned that one of the CA and CB can be fixed, while the other varies, hence the limitation "body voltage ...differ from the plate-to-body voltage and to vary as a function of the plate-to-body voltage as the plate-to-body-voltage is varied".

Regarding claims 20, 29, 30, 39, 40, and 73, capacitance dependency on the plate area, an inversion layer in the body region, and dependency of the capacitance on the inversion area all are inherent properties of the device.

Regarding claims 47-52, 55, 56, 57-60, 63, 75-78, and 85-88, see figure 6 and column 6, lines18-67, wherein there is a capacitance signal path through capacitor Cext, the plate and body electrodes of either V1 or Vn is in that path. Also, there are inductors L1 and L2 to function with either of the varactors.

Regarding claims 22, 31, 42, 54; 62, 64-66, 74, and 84, see figure 10, and column 8, lines 52-67, wherein there is finger portions shown in the figure at least one of them (90 and 91) continuous with the main plate portion extending laterally away from it and meeting the body region there along.

Regarding claims 89-98 and 100-101, Litwin discloses in figure 8 (note that the plate and body regions here correspond to the same regions as figure 4, that is any one of the regions 73 or 74 is a plate region and n-well 72 is the body region), a field insulating region extending into the semiconductor body (although the insulating film corresponding to the gates 76 is not numbered in this figure, it is present beneath the gate regions 76, along with the insulating film on the surface of the well region. See the description of figures 7 and 8; columns 7 and 8) along the primary surface to define a semiconductor island laterally surrounded by the field insulating

region and substantially fully occupied by material of the plate and body regions, that is the material in regions 72, 73, and 74.

Regarding claims 102-104 and 117-119, Litwin discloses in column 5, lines 34-36, that the capacitance can be controlled by applying a voltage between the gate and the plate region.

Regarding claim 105-113, 115, and 120-122, see figure 6.

Regarding claim 116, see column 5, lines 59-67, wherein it is stated that one of CA and CB can be fixed, while the other is varied. Also stated is that the well can have a bias voltage of its own.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 32-37, 68, 99, 114 are rejected under 35 U.S.C. 103(a) as being unpatentable over Litwin as applied to claims rejected above under 35 U.S.C. 102(e), and further in view of the Japanese patent issued to Misu et al. (ID#:07226643).

Litwin discloses the claimed invention, as discussed above, except for at least two of the finger portions are non-parallel to another.

The Japanese patent discloses in figures 7 and 9, and the paragraph titled PURPOSE, that unparallel conductive finger shaped regions in a device prevents the crossing part of the same center frequency from continuing. Therefore, it would have been obvious to one of ordinary skill

in the art at the time of the invention to make the finger shaped electrodes in Litwin's structure unparallel to one another in order to prevent some parts of the frequency from crossing the region in which the finger shaped electrodes are being used.

Response to Arguments

5. claims 33-37 which were rejected under 35 USC 102(e), are now corrected and are rejected under 35 USC 103(a). Also, claim 70 is now rejected under 35 USC 102(e) and not 103(a).

6. Applicant's arguments filed 7/21/04 have been fully considered but they are not persuasive.

Applicant argues that claims 17 and 71 each require that the gate-to-body voltage be maintained approximately constant at a non-zero value. However, as applicant identifies in operational mode 2, the well region could have a distinct electrode that is not shown in the figures. This is also indicated at column 5, line 62. Earlier in column 5, it is stated that different voltages can be applied to the gate and plate region. Since the body region could have a distinct voltage control electrode other than the plate and the gate electrodes, then it follows that the well and the plate voltages can be different, while the plate voltage varies. This is same as mode 1 as identified by applicant, and also indicated at column 5 of Litwin, lines 24-26.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dana Farahani whose telephone number is (571)272-1706. The examiner can normally be reached on M-F 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703)308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7722 for regular communications and (703)308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

D. Farahani

LONG PHAM
PRIMARY EXAMINER